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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of)

KULA et al.)

Application No. 09/846,707)

Filed: 04/30/2001)

For: UNDERLAYER FOR HIGH)
AMPLITUDE SPIN VALVE)
SENSORS)

Group Art Unit: 2652

Examiner: MILLER, Brian E.

Attorney Docket No.
SJO9-2000-0121US1/HTT1P039

Date: November 4, 2004

CERTIFICATE OF FACSIMILE

I hereby certify that this correspondence is being facsimile
transmitted to the Commissioner for Patents via facsimile to fax
number: (703) 872-9306 on November 4, 2004

Signed: Nancy N. Rushon

Nancy N. Rushon

AMENDMENT E

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed October 20, 2004, please enter the
following amendments believed to place the claims in condition for allowance.

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- 1 -

*Do not enter
Bm 11/29/04*

AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

LISTING OF CLAIMS:

1. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising:
 - a pinned layer having a pinned layer magnetization;
 - a free layer disposed towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;
 - a spacer layer disposed between the free layer and the pinned layer;
 - a pinning layer disposed towards the pinned layer for fixing the pinned layer magnetization;
 - an underlayer disposed towards the pinning layer, the underlayer comprising NiFeX; and
 - an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising at least one material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;
 - ~~wherein the sensor provides an increase of $\Delta R/R$ of at least 5% when compared to an otherwise identical sensor not having the upper layer~~
 - wherein the upper layer is doped for at least one of reducing an electrical conductivity of the upper layer and reducing magnetic properties of the upper layer.
2. (PREVIOUSLY PRESENTED) The spin valve sensor as recited in claim 1, wherein the upper layer has a thickness of at least 4 Å.
3. (PREVIOUSLY PRESENTED) The spin valve sensor as recited in claim 1, wherein the upper layer has a thickness of less than 5 Å.

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